CARGILL
SALT DIVISION

7200 Central Ave.
Newark, CA 94560-4206
510/797-1820 1-800-321-1458
Admin FAX: 510/790-8162
Plant FAX: 510/790-8189

April 14, 1993

APR 19 1993

Mr. Steve Ritchie
CA Regional Water Quality Control Board
S.F. Bay Region
2101 Webster Street
Suite 500
Oakland, CA 94612

ATTENTION: Lila Tang

Dear Mr. Ritchie:

Please find attached the self-monitoring report for the NPDES Permit No. CA0028690, Order 88-163 for our Redwood City facility wet weather discharge of rainwater from our salt crystallizer beds.

Discharge of rainwater from the crystallizer beds occurred March 2, 3 & 26, 1993. A total of approximately 19 acre feet of water was discharged to First Slough in Redwood City. The field samples taken showed a Baume of 2.5, 2.7 and 2.9 and a pH of 8.1 & 8.4. The laboratory measurement of TDS was 26,600 ppm.

One violation was noted in this report. The BOD concentration exceeded the limit in our NPDES permit. One possible cause of the elevated BOD is older waters from previous water movements resting at the point of discharge. We do not feel the high BOD was representative of the rainwater from the crystallizer. We are not sure how to remove these other waters prior to discharge and would like to discuss this issue with the RWQCB.

> "I certify under penalty of law that this document and all attachment are prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. [40 CFR 122.22(d)]"

Sincerely,

Barbara N. Ransom
Manager, Environmental Affairs

cc: U.S. Environmental Protection Agency

BOD violation @ 120 mg/l (limit = 20 mg/l). From meeting on 5/6/93: High BOD from water sitting in discharge structure; Cargill will pump out prior to use for discharge in future. No further follow up necessary.

LWT
6/3/93

7212 7125

b. COMPLIANCE EVALUATION SUMMARY

Effluent Limitations

1. The discharge of Waste No. 1 containing constituents in excess of the following limits is prohibited:

Constituents	Units	Maximum	Results
Total Dissolved Solids	mg/l	32,000	2.5, 2.7 & 2.9 Be in field. 26,600 ppm Laboratory
Biochemical Oxygen Demand Five Day	mg/l	20	120
Arsenic	µg/l	20	Monthly Sample Not Run
Cadmium	µg/l	10	"
Chromium (VI)[a]	µg/l	11	"
Copper	µg/l	20	"
Lead	µg/l	5.6	"
Mercury	µg/l	1	"
Nickel	µg/l	7.1	"
Silver	µg/l	2.3	"
Zinc	µg/l	58	"

[a]The Discharge may meet this limit as total chromium

		Results
2.	Waste No. 1 shall not have a pH less than 6.5 nor greater than 8.5.	8.1 & 8.4 pH 8.76 lab

3. The survival of test fishes of the specie *Menidia beryllina* or silverside minnow in a 96 hours static bioassay of the discharge of Waste No. 1 shall be a median of 90 percent survival and a 90 percentile falue of not less than 70 percent survival.

Results: Not acutely toxic to *Menidia.* See attached S.R. Hansen & Associates discussion.

APPENDIX C. MAP

CARGILL SALT

REDWOOD CITY FACILITY


Discharge
Sampling Point
Brine M
9
5
6

APPENDIX D.

LABORATORY DATA

REPORT OF ACUTE BIOMONITORING TEST

CARGILL SALT, REDWOOD CITY FACILITY
RAINWATER DISCHARGE PROGRAM
COLLECTED 02 MARCH, 1993

Prepared for

Cargill Salt Company
7200 Central Avenue
Newark, California 94560-4206

Prepared by

S.R. Hansen & Associates
4085 Nelson Ave, Suite I
Concord, Ca. 94520

MARCH 1993

1. INTRODUCTION

Beginning in February, 1993, S.R. Hansen & Associates began conducting static acute toxicity tests for the Cargill Salt Company as part of the stormwater discharge compliance monitoring mandated in the facility's NPDES permit. This report describes the procedures used and the results obtained for acute toxicity tests performed on March 03, 1993 on a sample discharged from the Redwood City facility's crystallizer bed on March 02, 1993.

2. MATERIALS AND METHODS

Sample Collection - A grab sample of rainwater discharge from the Redwood City Crystallizer was collected by the Cargill Salt Company staff on March 02, 1993. A portion of the sample was stored in 5 gallon cubitainers; the remaining sample was placed into three (3) one-liter bottles (each preserved according to the analysis to be performed), stored at 4°C, and packed in an ice chest for transport to the S.R. Hansen & Associates (SRH&A) laboratory via SRH&A courier. Toxicity testing was initiated 24 hours after the arrival of the sample at the SRH&A laboratory, due to fish availability. The samples that were separated for chemical analyses were delivered, via overnight courier, to outside contract labs (Enseco Cal Lab, Sacramento, CA and Brown & Caldwell, Emeryville, CA).

Test Organisms - An acute bioassay was performed using silverside *Menidia beryllina.* The *Menidia* were obtained from outside suppliers.

Test Procedures - *Menidia beryllina* (10 days old) were obtained from Aquatic Resources (Sebastopol, CA.) and were held in a five gallon aquarium prior to use in the test. The animals were exposed to a dilution series of effluent for a period of 96 hours under static-renewal conditions. One-liter beakers were used for the exposures, with a total volume of 500 ml of sample added to each beaker. Ten fish were placed in each container, and each concentration was run in duplicate. Each exposure solution was renewed on a daily basis with freshly prepared dilutions of the original effluent sample. The diluent for this test was

Bodega Bay water diluted with Arrowhead Spring Water to a salinity of 22 ppt. (the salinity of the sample). Temperature, dissolved oxygen, pH, salinity, and number of dead organisms were recorded daily in each concentration. Ammonia was measured in the 100% effluent concentration at the beginning of the test. The binomial statistical method was used to calculate 96-hr LC50 values.

Chemical Analyses - Aliquots of the sample were sent via overnight courier (Federal Express) to contract analytical labs (Enseco Cal Lab, Sacramento, CA and Brown & Caldwell, Emeryville, CA) immediately upon their arrival at the SRH&A Laboratory.

3. RESULTS

The results of the acute toxicity test performed on the March 02, 1993 sample of the Redwood City Facility crystallizer discharge are presented in Tables 1, and 2 and can be summarized as follows:

Menidia beryllina (96-hr LC50)	=	>100% Effluent
Ammonia	=	<0.2mg/L
Specific Conductivity	=	30,000 uMHOS/cm
Salinity	=	22 ppt
pH	=	8.76

The data sheet for this bioassay test and the results reported by our contract labs are provided in the Appendix to this report.

TABLE 1. RESULTS OF 96-HR *MENIDIA BERYLLINA* BIOASSAY ON REDWOOD CITY CRYSTALLIZER STORMWATER DISCHARGE SAMPLE COLLECTED MARCH 02, 1993

Concentration (% Effluent)	% Survival Replicate A	% Survival Replicate B
100	100	100
50	90	100
25	100	100
10	100	100
5	100	100
Control	100	90

TABLE 3. RESULTS OF CHEMICAL ANALYSES
ON REDWOOD CITY CRYSTALLIZER
STORMWATER DISCHARGE SAMPLE
COLLECTED MARCH 02, 1993

Analyte	Concentration (mg/L)	Permit Limits (mg/L)	Method Number
Total Dissolved Solids (TDS)	26,600	32,000	160.1
Biological Oxygen Demand (BOD)	120	20	405.1

4. DISCUSSION

The results of this toxicity testing event indicate that the stormwater discharge from the Redwood City Crystallizer ponds was not acutely toxic to *Menidia beryllina.* All chemical parameters that were tested were within the limits that are required in the Cargill Salt Company's discharge permit, except for BOD.

APPENDIX

LABORATORY DATA SHEETS

S.R. HANSEN & ASSOCIATES Cargill - Redwood City

ACUTE TEST DATA SHEET

START DATE 3/3/93 TIME 1420 BD TEST MATERIAL Crystalline #9 DILUTION WATER 22‰ Bodega/spring
END DATE 3/7/93 TIME 1330 CW SPECIES/AGE M. beryllina 1 day

old/new old/new

CONC. ‰	DATE	TEMP. °C	D.O.		pH		SALINITY ‰		# LIVE ORGANISMS				Preparation
Control	3/3/93	20	8.6		7.77		21		10	10			TIME: 1420
5			8.6		7.86		22		10	10			DATE: 3/3/93
10			8.6		7.94		22		10	10			ANALYST: BD
25			8.5		8.19		22		10	10			
50			8.3		8.41		22		10	10			
100			8.1		8.74		22		10	10			
Control	3/4/93	20	*6.1	8.3	*7.70	7.75	21		10	10			TIME: 1530
5			6.2	8.1	7.74	7.89	21		10	10			DATE: 3/4/93
10			6.3	7.9	7.79	7.97	21		10	10			ANALYST: BD
25			6.6	7.9	7.91	8.04	22		10	10			
50			6.6	7.8	8.10	8.31	22		10	10			
100			6.8	7.7	8.35	8.62	22		10	10			
Control	3/5/93	20	6.9	8.1	7.83	7.88	22		10	9			TIME: 1510
5			7.0	8.1	7.87	7.95	22		10	10			DATE: 3/5/93
10			7.1	8.1	7.91	8.03	22		10	10			ANALYST: BD
25			7.3	8.0	8.02	8.20	22		10	10			
50			7.4	8.0	8.16	8.39	22		9	10			
100			7.2	8.0	8.39	8.68	23		10	10			
Control	3/6/93	20	7.4	8.8	7.78	7.91	21		10	9			TIME: 1615
5			7.5	8.2	7.83	7.91	22		10	10			DATE: 3/6/93
10			7.5	8.0	7.88	7.99	22		10	10			ANALYST: BD
25			7.6	8.0	7.94	8.11	22		10	10			
50			8.0	8.0	8.14	8.34	22		9	10			
100			8.1	7.9	8.33	8.62	23		10	10			
Control	3-7-93	19	7.5		7.78		22		10	9			TIME: 1330
5			7.6		7.83		22		10	10			DATE: 3-7-93
10			7.6		7.87		22		10	10			ANALYST: BD
25			7.6		7.97		22		10	10			
50			8.1		8.16		22		9	10			
100	↓	↓	8.0		8.35		23		10	10			

feed

*24 HR READINGS.

TABLE OF CONTENTS

ENSECO CAL LAB PROJECT NUMBER 068459

Enseco
A Coming Company

CASE NARRATIVE

ENSECO CAL LAB PROJECT NUMBER 068459

There were no anomalies associated with this report.

ENSECO CAL LAB'S QUALITY ASSURANCE PROGRAM

Enseco Cal Lab has implemented an extensive Quality Assurance (QA) program to ensure the production of scientifically sound, legally defensible data of known documental quality. A key element of this program is Enseco's Laboratory Control Sample (LCS) system. Controlling lab operations with LCS (as opposed to matrix spike/matrix spike duplicate samples), allows the lab to differentiate between bias as a result of procedural errors versus bias due to matrix effects. The analyst can then identify and implement the appropriate corrective actions at the bench level, without waiting for extensive senior level review or costly and time-consuming sample re-analyses. The LCS program also provides our client with information to assess batch, and overall laboratory performance.

Laboratory Control Samples - (LCS)

Laboratory Control Samples (LCS) are well-characterized, laboratory generated samples used to monitor the laboratory's day-to-day performance of routine analytical methods. The results of the LCS are compared to well-defined laboratory acceptance criteria to determine whether the laboratory system is "in control". Three types of LCS are routinely analyzed: Duplicate Control Samples (DCS), Single Control Samples (SCS), and method blanks. Each of these LCS are described below.

Duplicate Control Samples. A DCS is a well-characterized matrix (blank water, sand, sodium sulfate or celite) which is spiked with certain target parameters and analyzed at approximately 10% of the sample load in order to establish method-specific control limits.

Single Control Samples. An SCS consists of a control matrix that is spiked with surrogate compounds appropriate to the method being used. In cases where no surrogate is available, (e.g. metals or conventional analyses) a single control sample identical to the DCS serves as the control sample. An SCS is prepared for each sample lot. Accuracy is calculated identically to the DCS.

Method Blank Results. A method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your samples.

Enseco
A Coming Company

SAMPLE DESCRIPTION INFORMATION
for
S.R. Hansen & Associates

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
068459-0001-SA	RWC Crystallizer #9	AQUEOUS	02 MAR 93	08:00	04 MAR 93

S.R. HANSEN & ASSOCIATES

CHAIN OF CUSTODY RECORD

PROJ. NO.: Cargill Salt (NPDES) Monthly	PROJECT NAME: Cargill Redwood City	NO./SIZE OF CONTAINERS	REMARKS
SAMPLERS: (SIGNATURE) [signature]			

DATE	TIME	COMP.	GRAB	STATION LOCATION/#		NO./SIZE OF CONTAINERS	REMARKS
030293	0800		✓	RWC Crystallizer #9		1x1000ml	TDS

RELINQUISHED BY: (SIGNATURE) [signature] DATE/TIME 030353/1320 RECEIVED BY: (SIGNATURE)

RELINQUISHED BY: (SIGNATURE) DATE/TIME RECEIVED BY: (SIGNATURE)

4085 Nelson Avenue, Suite I • Concord, CA 94520 • (510) 687-5400 • Fax (510) 687-2296

Two week turn around

Total Dissolved Solids - Method 160.1

Enseco
A Coming Company

GENERAL INORGANICS

(Water)

Client Name: S.R. Hansen & Associates
Client ID: RWC Crystallizer #9
Lab ID: 068459-0001-SA
Matrix: AQUEOUS Sampled: 02 MAR 93 Received: 04 MAR 93
Authorized: 04 MAR 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Solids, Total Dissolved	26600	mg/L	500	160.1	NA	06 MAR 93 R

Note R : Raised reporting limit(s) due to high analyte level(s).

ND = Not detected
NA = Not applicable

Reported By: Larry Tellers Approved By: Hamid Foolad

The cover letter is an integral part of this report.
Rev 230787

S.R. HANSEN & ASSOCIATES

BCA# 130305E1

CHAIN OF CUSTODY RECORD

PROJ. NO.: CARGILL SALT / REDWOOD CITY PLANT	PROJECT NAME: BAY WATER CRYSTALIZER BEDS	NO./SIZE OF CONTAINERS	REMARKS
SAMPLERS: (*SIGNATURE*)			

DATE	TIME	COMP.	GRAB	STATION LOCATION/#	NO./SIZE OF CONTAINERS	REMARKS
3/2/93	8:00 AM	NO	✓	CRYSTALIZER #9	(2) 5 GALLON	ACCORDING TO
					(3) 1 LITER	AGREEMENT WITH
						CARGILL SALT CO.
					BCA REC'd	P.O. BOX 364
					one 1 liter	NEWMARK CA. 94560
					bottle for	
					RED CRYSTALIZER	2.5° BE
					BINDS	PH - 8+
					3/2/93	
						CRYSTALIZER # 9

RELINQUISHED BY: (SIGNATURE) Cynthia Tauber — DATE/TIME 3-2-93 3:50 pm — RECEIVED BY: (SIGNATURE)

RELINQUISHED BY: (SIGNATURE) — DATE/TIME 3-2-93 500 — RECEIVED BY: (SIGNATURE) Bennett Baldwin 3-2-93 17:00

4085 Nelson Avenue, Suite I • Concord, CA 94520 • (510) 687-5400 • Fax (510) 687-2296

B C Analytical

1255 Powell Street
Emeryville, CA 94608
510/428-2300
Fax: 510/547-3643

ANALYTICAL REPORT

LOG NO: E93-03-063

Received: 02 MAR 93

Mailed: [illegible] 93

Dr. Stephen Hansen
S.R. Hansen & Associates
4085 Nelson Avenue , Suite I
Concord, California 94520

Project: CARGILLSALT

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, WASTEWATER SAMPLES	DATE SAMPLED
03-063-1	Crystalizer #9	02 MAR 93

PARAMETER	03-063-1
Biochemical Oxygen Demand, mg/L	120

Edward Wilson, Laboratory Director

BCA

e. EFFLUENT DATA SUMMARY

Not Applicable

f. LIST OF APPROVED ANALYSES

Not Applicable

g. FLOW DATA

Total Discharge 19 acre feet